

## RESEARCH ARTICLE

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# Exploring the predictable classroom: preschool teacher stress, emotional supportiveness, and students' social-emotional behavior in private and Head Start classrooms

Katherine M. Zinsser, Craig S. Bailey, Timothy W. Curby, Susanne A. Denham,  
and Hideko H. Bassett

*George Mason University*

The present study builds on an expanding body of research on the benefits of emotionally supportive interactions, including the extent to which teachers vary in their emotional supportive interactions over time, on preschoolers' social-emotional development. Using data collected in both private and Head Start preschool classrooms, we examined associations between mean levels and variability in emotional support, teachers' stress, and children's social and emotional behaviors in the classroom. Separate analyses were conducted for Head Start and private centers as a result of descriptive analyses that indicated the settings were different. Overall, Head Start teachers showed less stress, higher levels of emotional support, and more consistency in emotional support. Furthermore, children in Head Start classrooms were less emotionally negative and aggressive. In private centers, teacher stress, variability in emotional support, and an interaction of mean level and variability in emotional support all predicted children's behavior. Private center children showed more negative emotion and aggression in classrooms with teachers who were inconsistent in their emotional supportiveness, even when those teachers were, on average, very supportive. These findings support the inclusion of variability of emotional support as an indicator of classroom quality and emphasize the importance of assisting teachers with managing classroom-related stress.

*Keywords:* emotional support, variability, consistency, teacher stress, preschool, social-emotional behavior.

Children's experiences in early childhood classrooms can establish a cycle of future social success or failure (Campbell & Stauffenberg, 2008). In these classrooms, the quality of teachers' interactions with children is one of the most salient features of children's experiences (Pianta, 1999). An emerging body of research has shown that the average quality of emotional support that children experience may not capture all aspects of the emotional environment that are important (Curby, Brock & Hamre, 2013; Curby et al., 2011). Curby and colleagues argue for recognizing the variability in emotional supportiveness over time when examining relations between teacher-student interactions and child outcomes. In other words, they argue that the

consistency of emotional support within a day has positive implications for the children in those classrooms. Thus, a major goal of this study is to determine whether variability in teachers' emotional support is a predictor of children's outcomes in samples of private and Head Start preschool classrooms. Relatedly, we also considered that the variability in emotional support may have different implications for children's outcomes based on the mean levels of emotional support. Another goal of this study revolves around understanding how preschoolers' social-emotional behavior is associated with environmental factors that may be related to teachers' variability in the emotional support, such as levels of teacher stress. These goals are addressed by examining the associations between teachers' mean levels of emotional support and variability in emotional support and children's social and emotional functioning while also considering other possible teacher- and school-level influences.

### Emotional Support and Social-Emotional Functioning

In a preschool classroom, myriad interactions filled with emotions occur within the noisy hustle and bustle of play. Classrooms are social places, and preschoolers use their emotions when interacting with peers and teachers (Zins et al., 2007). These interactions assist children in acquiring crucial social and emotional skills that have significant ramifications on academic success and school adjustment (Blair, 2003; Denham, Zinsler, & Brown, *in press*; Graziano, Reavis, Keane, & Calkins, 2007; Leerkes, Paradise, O'Brien, Calkins, & Lange, 2008; Shields et al., 2001; Trentacosta & Izard, 2007). These social-emotional skills can be observed when children successfully express how they feel to teachers and peers, when they control their emotions during social interactions, when they successfully join activities with peers, and when they use prosocial strategies rather than resorting to aggression. Thus, children's experiences in early childhood classrooms, including the quality of their interactions with teachers, shape their acquisition of appropriate emotional expression and regulation, behavior regulation, and relationship skills (Denham, Bassett, Kalb, Mincic, Segal, & Zinsler, 2012).

The interactions between children and the adults who care for them strongly influence children's development in many domains (Rimm-Kaufman & Pianta, 2000). One of the strongest influences on the types of experiences a child has at school is his or her teacher (Nye, Konstantopoulos, & Hedges, 2004; Rowan, Correnti, & Miller, 2002). Higher levels of emotional support by teachers is associated with better child outcomes academically and socially (Howes et al., 2008; Mashburn et al., 2008; Stipek & Byler, 2004), in part because teachers develop consistent, warm, and caring attachment relationships with children (Mitchell-Copeland, Denham, & DeMulder, 1997). Emotionally supportive teachers tend to be more aware of students' needs for extra academic or social support and tend to respond appropriately to these needs (Hamre & Pianta, 2007). Consequently, children in classrooms with more supportive teachers display more adaptive classroom behaviors and better academic outcomes (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009; Graziano, et al., 2007).

### Variability in Emotional Support and Social-Emotional Functioning

The emotional supportiveness of a classroom is often captured through multiple observations of teacher-child interactions. Typically, such observation ratings are combined to yield an average

classroom score. However, this average does not fully capture a child's experience in the classroom. Children's experience will differ between teachers with the same emotional support average but varying levels of consistency. By observing a classroom multiple times within a day, consistency in emotional support can be quantified, as we have done in the present study. Consistent teachers vary relatively little across time in their emotional support whereas inconsistent (or variable) teachers will vary more. Having consistent levels of emotional support does not mean that each teacher's interactions with students are identical over the day. Rather, each teacher's interactions with students are at or near the same level of quality. For example, a teacher characterized as consistent in her emotional supportiveness would respond to almost every student need with a consistently friendly, patient demeanor – not necessarily responding to each bid the same way. By contrast, teachers who show greater variability in their emotional supportiveness may at times enthusiastically attend to students' needs, yet at other times respond with flat affect or ignore children's needs.

The importance of consistency in the classroom can be likened to its importance at home. Parenting and attachment literature has supported the finding that consistent interactions are a hallmark of forming a secure attachment, and failure to form a secure attachment can have long-reaching deleterious effects on children's social-emotional development (Ainsworth, 1969; Baumrind, 1966; Bowlby, 1969). As children are said to form attachment-like relationships with early childhood education teachers (Pianta, 1999), Curby and Brock have argued that consistency in emotional support should also be examined in the classroom (Curby et al., 2012).

Consistency in emotional support is an emerging indicator of the quality of teachers' interactions with students. In addition to associations with attachment, the role of consistency in emotional support has been linked to children's academic achievement gains and social skills (Curby et al., 2011). Curby and colleagues found that preschoolers in emotionally consistent classrooms showed greater gains in academic outcomes and better social outcomes in kindergarten compared to children in less consistent classrooms. In explaining the harmful effect of variable emotional support quality, Curby and colleagues posited that such inconsistency might place greater demands on children's attentional networks and negatively influence their ability to regulate their emotions and behavior (Kaplan & Berman, 2010; Posner & Rothbart, 2002). Children in more variable classrooms must exert more effort in monitoring their teacher's emotional state and therefore have less attention available for the management of their own behavior and learning. As socializers of children's emotional competence, teachers play a vital role in helping children learn how to accurately predict and respond to others' emotions (Denham, Bassett, & Zinsser, 2012), and based on the state of the currently available literature, we anticipated finding associations between teachers' variability in supportiveness and their students' social emotional functioning in the classroom.

What remains unclear from the currently available research is whether consistency in emotional support by teachers is equally beneficial at all levels of emotional support. Do children who are in classrooms with consistent but lower levels of emotional support fare better than children in classrooms with higher but less consistent levels of emotional support? To answer this question, we investigated the moderating role that consistency in emotional support has on the mean levels of emotional support in regards to children's social and emotional functioning.

## Teacher Stress

In addition to the effects that teachers' emotional supportiveness can have on students, we are also aware that there are many factors that may influence teachers' average levels of support and variability in supportiveness in the classroom. In particular, we examined the role of stress. As with parents (Anthony et al., 2005; Denham, 1989; 1993), teachers' management of their own emotional lives undoubtedly contributes to their socialization of children's emotional competence (Denham et al., 2012; Denham, Mitchell-Copeland, Standberg, Auerbach, & Blair, 1997). Consequently, teachers' management of their emotions may be directly related to their experience of stress at work. Job-related stress, such as feeling pressured by families, lack of sufficient resources, perceptions of appreciation, long work hours, etc. (Curbow, Spratt, Ungaretti, McDonnell, & Breckler, 2000) may undermine teachers' ability to provide consistent and emotionally supportive classrooms. Stressed or emotionally exhausted teachers on the "burnout cascade" (Jennings & Greenberg, 2009) may be less able to manage the social and emotional challenges in their classroom, which ultimately may lead to negative child outcomes. For instance, less emotionally competent teachers have students who show poorer attention and greater problem behavior (Marzano, Marzano, & Pickering, 2003).

Many aspects of teacher stress have been explored, including: causal pathways to explain teacher stress (e.g., Tellenback et al, 1983), how teachers cope with stress (e.g., Borg & Falzon, 1990), how schools can reduce stress (Sheffield et al, 1994), and intervention programs for stressed teachers (Roger & Hudson, 1995). However, little of this research has included the impacts of stress on the learning environments of students and how stress may attenuate the emotional support that teachers provide. In his review, Kyriacou (2001) called for additional research into how external demands and pressures on teachers may impact positive teacher-student interactions. In the present study, we heeded Kyriacou's call and anticipate an association between teachers' perceptions of their own stress and their ability to provide an emotionally supportive and consistent environment for children.

## Children's Age and Gender

We also recognize that there are many factors beyond teacher stress and teacher support that may influence child behavior. Children's social and emotional behaviors differ according to age, gender, and risk status. Emotion and behavior regulation develop throughout the time children are in preschool, with older children showing greater competencies in these areas (McCabe & Brooks-Gunn, 2009). Similarly, prosocial behavior increases with age (Denham & Couchoud, 1991) and emotional expressiveness decreases (Denny, Denny, & Rust, 1982). When differences are found, girls express more positive emotions (Garner, Robertson, & Smith, 2008) and display more prosocial behaviors than boys (Denham, McKinley, Couchoud, & Holt, 1990). In order to account for these differences, our models included child age and gender.

## Head Start and Private Centers

In addition to child-level differences, there are differences between public preschool programs, such as Head Start, and for-profit centers that typically serve children who are at less economic

risk. Children from low-income families tend to be at-risk for developmental difficulties in the areas of emotional and behavioral regulation (Morrison et al., 2010) and relationship skills (Phillip & Lonigan, 2010). Although high-quality centers can be found in all types of childcare (Helburn, 1995), there is some concern that various differences (e.g., level of poverty, oversight by governing body, sources of funding, and accountability to regulators) may have implications for program quality and child outcomes (Morris & Helburn, 2000). Yet, Sosinsky and colleagues found that positive care-giving interactions were more frequent in nonprofit childcare centers (e.g., Head Start) and preschools than in for-profit, private child care centers. Some programmatic differences may impact teacher stress and the provision of consistent, high quality emotional support in the classroom. For example, Sosinsky, Lord, & Zigler (2007) found that, in general, nonprofit childcare is of higher quality and the teachers are paid more and are better educated. Therefore, we tested differences between public Head Start centers vs. private for-profit centers.

## Present Study

The aim of this study is to determine whether variability in emotional support is related to children's social and emotional behaviors and whether variability in emotional support is equally deleterious to children's social-emotional functioning at all levels of supportiveness. In addition, we aim to understand how the effects of these potential interactions on preschoolers' behaviors may also be associated with the other critical features of the school environment, namely, teachers' stress levels and center type (Head Start vs. Private). Specifically, we address the following research questions: (a) What are the differences between private and Head Start centers on measures of teacher stress, emotional support, and children's social and emotional behavior? (b) What is the role of teacher stress on child social-emotional functioning in the classroom? (c) What are the separate and combined associations of overall mean level and variability in emotional support with child social-emotional functioning?

## METHODS

### Participants

Participants were part of a larger study focused on developing a direct assessment battery for measuring the social and emotional aspects of school readiness. Teachers were recruited at staff meetings at the beginning of the school year and completed questionnaires over the winter and spring of that same year. The teachers in both center types (Head Start  $n = 9$ , for-profit private  $n = 32$ ) were all female. Head Start teachers were 41.7% African American, 33.3% Caucasian, and 25.0% Other (Asian, Native American, or Pacific Islander). Private center teachers were 33.3% African American, 54.5% Caucasian, and 18.0% Other (Asian, Native American, or Pacific Islander).

Three- and 4-year-olds (Head Start  $n = 98$ , private  $n = 179$ ) were recruited from the classrooms of participating teachers at Head Starts and private childcare centers in the Northern Virginia area. About half the Head Start students were African American (50.5%) and a predominant

number of children in private centers were Caucasian (66.0%). Children at both center types were nearly evenly split by gender (51.0% female).

## Measures

*Emotional support.* Observations of emotional support were coded using the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) over four contiguous observation cycles within a day. Each observation cycle consisted of a 20-minute observation followed by a 10-minute rating period. During each rating cycle, ten dimensions of quality in teachers' interactions with children were coded. Each dimension was scored on a Likert-type scale from 1 = *low* to 7 = *high*. Based on theoretical (Hamre & Pianta, 2007) and empirical (Mashburn, Hamre, Downer, & Pianta, 2007) work, three domains are formed from ten dimensions: Emotional Support, Classroom Organization, and Instructional Support. The present study focuses only on the Emotional Support of the classroom.

Emotional Support is an average of four observed dimensions ( $\alpha = 0.81$ ): Positive Climate, Negative Climate (reversed), Teacher Sensitivity, and Regard for Student Perspectives. Positive Climate describes the extent to which teachers create an emotional atmosphere conducive to learning. Teachers whose interactions foster relational closeness, enthusiasm, and respect rate highly on Positive Climate. Negative Climate (reversed for analysis) refers to teachers' expressed irritability, anger, or aggression. Teacher Sensitivity captures teachers' interactions that support individual student needs, academic or emotional. Regard for Student Perspectives describes the degree to which the teachers' interactions with students and classroom activities place an emphasis on students' interests, motivations, and points of view, rather than being teacher-driven (Hamre & Pianta, 2007).

*Variability in emotional support.* Within-day variability was calculated for Emotional Support by computing the standard deviation (*SD*) across a given teacher's four CLASS observations. This measure of variability in emotional support was entered into the models described below as a predictor in *SD* units.

*Training and reliability.* All raters attended a two-day training in which video segments of actual classrooms were observed in relation to the CLASS scoring manual. To be deemed reliable at the end of the training, raters had to score within one scale point of the master code on 80% of the dimensions across five, 20-minute videos. This criterion was met or exceeded by all raters. Beyond these criteria, in the current study approximately 20% of the classroom observations were dual-coded, with two trained CLASS raters observing the same teacher during the cycle. Intra-Class Correlations (ICC) for those dual-coded segments were high and ranged from 0.69 to 0.88, with an average correlation of 0.80.

*Teacher Stress.* The Job Demands scale of the teacher-reported Child Care Worker Job Stress Inventory (CCWJSI; Curbow et al., 2000) was used to assess teacher stress. The CCWJSI was developed through a combination of qualitative and quantitative research, and the full measure consists of three scales (Job Demands, Job Control, and Job Resources). For these analyses, we used only teachers' responses to 17 Job Demands scale questions about their frequency of experiencing various stressful events or feelings in the classroom on a five-point

Likert scale from 1 = *Rarely/Never* to 5 = *Most of the time*. Items included statements like “Parents come late to pick up their children,” “I feel I should be paid more for the work I do,” and “All of the children need attention at the same time.” This measure has been used previously with Head Start and private preschool teachers (Zhai, Raver, & Li-Grining, 2011) and prior work has shown that teachers’ experiences of high job demands are associated with feelings of burnout and exhaustion (Curbow et al., 2000; Li-Grining et al., 2010). In the present study the 17 items of the Job Demands scale were averaged to form a composite indicator of Teacher Stress which showed adequate reliability ( $\alpha = 0.82$ ).

*Children’s social-emotional functioning.* The Minnesota Preschool Affect Checklist (MPAC; Denham et al., 2012) was originally created as an observational means of assessing children’s emotional expression, emotion regulation, and social behavior (Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984), and was subsequently adapted by Denham and colleagues (MPAC-Revised; Denham & Burton, 1996; Denham, Zahn-Waxler, Cummings, & Iannotti, 1991). In this study, the revised and shortened version (MPAC-R/S; Denham et al., 2012) was used to record children’s social-emotional functioning observed on four separate school days in five minute intervals. All observations were conducted during the last four months of the school year. Coders were encouraged to observe during less structured periods (e.g., center time, outside recess, gym, etc.) as opposed to teacher-led instructional time.

Behaviors were observed using six scales of social-emotional functioning: positive affect expression (three items), negative affect expression (two items), involvement (four items; e.g. “The child is engrossed, absorbed, intensely involved in activity”), prosocial behaviors (four items; e.g. “The child jointly works with a peer or group of peers to achieve a common goal”), regulation of emotions (three items; e.g. “The child promptly verbally expresses feelings arising from a problem situation, then moves on to the same or a new activity”), and aggressive behaviors (three items; e.g. “The child displays context-related interpersonal aggression”). Regarding inter-observer reliability, a master coder and trained observers completed the MPAC-R/S’ six subscales across 19 reliability segments; average measure ICCs for the group were high and ranged from 0.84 to 0.98 across subscales, with an average correlation of 0.95 ( $SD = .04$ ). Ongoing work with the MPAC-R/S has established a three-component model, combining negative affect and aggressive behavior (Emotionally Negative/Aggressive); positive reactions to frustration and productive involvement in the environment (Emotionally Regulated/Productive); and positive affect and peer skills like joining activities with prosocial skills like sharing, listening, and cooperating (Emotionally Positive/Prosocial). Alphas for these factors were .71 for Emotionally Negative/Aggressive (five items), .47 for Emotionally Positive/Prosocial (seven items) and .57 for Emotionally Regulated/Productive (six items). Together, these three factors capture a wide variety of important aspects of children’s social-emotional functioning, and will be used in the following analyses.

## Data Analysis

Analyses examined the contribution of child-level characteristics (Gender and Age in Months) and classroom-level variables (Teacher Stress, Emotional Support Mean, Variability in Emotional Support, and the Emotional Support Mean X Variability interaction) to children’s

social-emotional functioning (Emotionally Negative/ Aggressive, Emotionally Regulated/ Prosocial, and Emotionally Positive/Productive). Following preliminary analyses, hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) was used to account for the fact that there were multiple children in the same classroom. HLM is a more complicated version of traditional least squares regression. HLM is able to account for the fact that multiple children are in the same classroom. The data from these children are not independent, which violates a major assumption of typical multiple regressions. Furthermore, it is the dependence (or shared variance) that we are interested in predicting using variables associated with the teacher and classroom. HLM adjusts the standard errors to appropriately model the structure of the data (Osborn, 2007).

HLM partitions variance in the outcome associated with child-level predictors (Level-1) from variance in the outcome associated with classroom-level predictors (Level-2). Predictors can thus be added at each level. The following equations represent our analyses:

Level-1 Model

$$Y_{ij} = b_0 + b_1(\text{Male}) + b_2(\text{Age}) + r$$

Level-2 Model

$$b_0 = \gamma_{00} + \gamma_{01}(\text{Stress}) + \gamma_{02}(\text{Emo. Mean}) + \gamma_{03}(\text{Emo. SD}) + \gamma_{04}(\text{Emo. Mean X SD}) + u_0$$

The Level-1 equation describes within-classroom variance based on children's characteristics. For child  $i$  in classroom  $j$ , the expected outcome,  $Y$ , is equal to the classroom average for that outcome,  $b_0$ , plus an effect for his or her gender (Male = 1),  $b_1$ , plus an effect for his or her average Age,  $b_2$ , plus error,  $r_{ij}$ . The Level-2 equation models between classroom variance using Stress, Mean Emotional Support, and Emotional Support Variability. Thus, the classroom average in each outcome,  $b_0$ , is equal to a grand average,  $\gamma_{00}$ , plus effects for average Teacher Stress,  $\gamma_{01}$ , plus the effect for the average mean levels of Emotional Support across all teachers,  $\gamma_{02}$ , plus the average effect for Variability in Emotional Support for all teachers,  $\gamma_{03}$ , plus the average effect for the moderation of Mean Emotional Support by Variability in Emotional Support,  $\gamma_{04}$ , plus error,  $u_0$ .

The variables Age, Stress, Mean Emotional Support and Variability in Emotional Support were centered according to their respective grand means across the entire dataset; the dichotomous variable "Male" was not centered so that the intercept would represent females and the coefficient for Male would represent the difference from that intercept for males. All variables on Level-2 were grand mean centered for two reasons: firstly, centering accounts for multicollinearity (Cohen, Cohen, Aiken & West, 2002), and secondly, centering generally yields estimates of  $b$  that are more easily interpreted.

As a preliminary first step, we examined the descriptive statistics and bivariate correlations in addition to the between center type  $t$ -tests. Next, unconditional HLM models for both Head Start and private centers were analyzed to estimate the amount of variance at the child and classroom levels. Unconditional multi-level models account for the nested structure of the data and its impact on each behavioral outcome and enabled us to calculate the amount of child-level and classroom-level variance for each outcome. By contrast, conditional models included all Level-1 and Level-2 predictors and allowed us to answer our research questions. Then, the conditional models were run separately for Head Start and private centers, a decision which is discussed in turn, for each of the three social-emotional factors, totaling six sets of analyses.



## RESULTS

### Descriptive Statistics

Means, standard deviations, and *t*-tests for all variables are presented in the bottom portion of Table 1 for each center type. Starting at the bottom of Table 1, *t*-tests revealed a number of statistically significant differences between children and teachers in private and Head Start centers. Children differed in their levels of Emotionally Negative/Aggressive behavior and Age and teachers differed in their Mean Emotional Support and were nearly significantly different in Stress. In addition, Head Start classrooms had teachers who were, on average, less stressed, less variable, and more emotionally supportive than private center teachers. This prompted us to also examine whether correlation patterns were similar across private and Head Start centers. Private center correlation patterns presented above the diagonal in Table 1 are quite different from the Head Start correlation patterns seen below the diagonal in Table 1. In Head Start classrooms, there were no statistically significant correlations with teacher stress. However, more emotionally supportive teachers were less variable and tended to teach older students in our sample. None of the child-level variables were correlated in the Head Start sample.

In private centers, teachers' mean level and consistency in emotional support were significantly and negatively correlated, indicating that more supportive teachers tended to be less variable. Additionally, more stressed private teachers tended to be less supportive overall and more variable in their provision of support. Their students also tended to display less regulation and involvement. More supportive private teachers had students who displayed fewer negative or aggressive behaviors and more regulation and involvement behaviors. Classrooms in private centers with older students also tended to have more supportive teachers who were less variable in their support. Observed Emotionally Negative/Aggressive behaviors in children from private classrooms were negatively correlated with Emotionally Positive/Prosocial behaviors. Additionally, correlations show that boys and older students displayed more involvement and regulation behaviors.

TABLE 1

Bivariate correlations, descriptive statistics, and t-test results in private centers and Head Start samples.

	1	2	3	4	5	6	7	8
1. Stress	-	-0.20**	0.36**	0.17	-0.18*	-0.14	-0.06	0.07
2. ES <sup>a</sup> Mean	-0.03	-	0.33**	-0.15*	0.17*	-0.01	0.06	0.28**
3. ES <sup>a</sup> Variability	0.09	-0.28**	-	0.07	0.05	-0.02	-0.14*	-0.17*
4. Emotionally Negative/Aggressive	0.01	-0.07	0.04	-	0.02	-0.17*	0.06	-0.19*
5. Emotionally Regulated/Productive	0.08	-0.03	0.04	0.11	-	-0.04	0.14*	0.19**
6. Emotionally Positive/Prosocial	0	0.04	-0.14	-0.16	0.13	-	-0.06	0.04
7. Sex <sup>c</sup>	0.08	0.12	-0.11	-0.03	0.10	0.15	-	0.08
8. Age <sup>d</sup>	-0.16	0.22*	-0.06	0.02	-0.15	0.14	-0.14	-
<i>N</i> <sub>Private</sub>	32	32	32	179	179	179	179	179
Mean <sub>Private</sub>	3.12	4.04	0.35	0.17	-0.05	-0.07		52.12
<i>SD</i> <sub>Private</sub>	0.58	0.64	0.17	1.02	1.10	0.98	0.50	8.01
<i>N</i> <sub>Head Start</sub>	9	9	9	98	98	98	98	98
Mean <sub>Head Start</sub>	2.57	4.58	0.28	-0.31	0.08	0.12		56.88
<i>SD</i> <sub>Head Start</sub>	0.69	0.36	0.10	0.90	0.80	1.02	0.50	6.40
<i>t</i> -test <sub>Mean<sup>d</sup></sub>	-1.84 <sup>†</sup>	3.24*	-1.06	-4.33*	1.21	1.65		5.75*

Note: Private center correlations presented above the diagonal, Head Start correlations presented below; all variables are reported prior to centering; <sup>a</sup> Emotion Support; <sup>b</sup> Sex coded as 0 = female, 1 = male; 51% of children each center type were female; <sup>c</sup> Age reported in months; <sup>d</sup> Equal variances not assumed.

<sup>†</sup>  $p \leq .10$ , \*  $p < .05$ , \*\*  $p < .01$

## Unconditional Models and Center-Type Differences

Examination of the intraclass correlations (ICCs) for the unconditional models (the uppermost portion of Table 2) indicated that the amount of children's social-emotional behavior attributable to the classrooms varied greatly across center type. Head Start classrooms accounted for 0 – 1% of the variance in children's outcomes whereas in private centers, classrooms accounted for 12 – 22% of the variance. Altogether, mean differences between center-type, correlational differences between center-type, and ICC differences between center-type led us to decide to run all analyses separately for Head Start and private centers. Given the differences in correlations between Head Start and private centers, running two sets of analyses allowed the associations within each respective center-type to vary. Although running two sets of analyses results in a loss of statistical power, the combined sample together does not have sufficient power to support the interactions required at an acceptable Type I error rate (Cohen et al., 2002).

TABLE 2  
Results from the HLM analyses examining the contribution of private preschool and Head Start teacher stress and emotional support to children's observed social-emotional functioning.

ICC	Emotionally Negative/Aggressive		Emotionally Regulated/Productive		Emotionally Positive/Prosocial	
	Head Start	Private	Head Start	Private	Head Start	Private
	b <sub>Head Start</sub>	b <sub>Private</sub>	b <sub>Head Start</sub>	b <sub>Private</sub>	b <sub>Head Start</sub>	b <sub>Private</sub>
Intercept	-0.27	0.08	0.06	-0.21 <sup>†</sup>	-0.13	-0.04
Stress	0.09	0.01	0.18	-0.43 <sup>**</sup>	0.03	-0.24 <sup>†</sup>
Mean ES	-0.36	-0.07	-0.25	0.19	-0.14	-0.08
Variability in ES	-1.90	0.85	-2.96	1.58 <sup>**</sup>	-0.93	-0.13
Mean X Variability	3.88	2.21 <sup>*</sup>	6.50	1.16	0.29	-0.51
Sex (1 = male)	0.02	0.12	0.14	0.33 <sup>†</sup>	0.45 <sup>*</sup>	-0.06
Age in Months	0.01	-0.02 <sup>*</sup>	-0.01	0.03 <sup>*</sup>	0.03 <sup>†</sup>	0.01

Note: HLM = hierarchical linear modeling; ICC = intraclass correlation

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Head Start model.** The conditional Head Start HLM model was run to address the second and third research questions about the contribution of teachers' stress, teachers' mean level of emotional support, and teachers' variability in emotional support on children's social-emotional functioning. Analyses indicated that none of the children's social-emotional functioning could be explained by Teacher Stress, Mean level and Variability in Emotional Support, or the moderation of Mean level by Variability (see Table 2). Following these statistically nonsignificant results for the Head Start sample, the remaining reported statistics will refer to private center model results.

*Private center model.* Using the model specified above, the research questions were addressed by including teacher-level variables (Teacher Stress, Mean-level Emotional Support, and Variability in Emotional Support) and child-level control variables (Gender and Age) in a model predicting children's social-emotional functioning. In private centers, Teacher Stress was statistically and negatively related to children's displays of Emotionally Regulated/Productive behavior and trended towards significance for Emotionally Positive/Prosocial. Teacher's Mean level of Emotional Support was not significantly related to any aspects of children's observed social-emotional functioning. Conversely, Variability in Emotional Support was significantly and positively related to children's Emotionally Regulated/Productive. Finally, the moderation of Mean by Variability in Emotional Support was statistically related to children's Emotionally Negative/Aggressive behavior. Simple slopes and an interaction graph were calculated and produced to further explore the statistically significant interaction term from the HLM analyses (Holmbeck, 2002; Shacham, 2009). The graph of the moderation (Figure 1) reveals that the association between children's behavior and their teachers' Mean-level Emotional Support is dependent on teachers' Variability in Emotional Support. Children in classrooms with teachers who were, on average, very supportive, displayed more negative emotion and aggression if their teacher was also highly variable (one standard deviation above the mean) in emotional support, an association that was found to be statistically significant. Conversely, in classrooms with less emotionally supportive teachers, variability can be beneficial, with students displaying fewer emotionally negative and aggressive behaviors if their teachers were more variable. However, the range in observed Emotionally Negative/Aggressive behavior was much narrower in these less supportive classrooms.

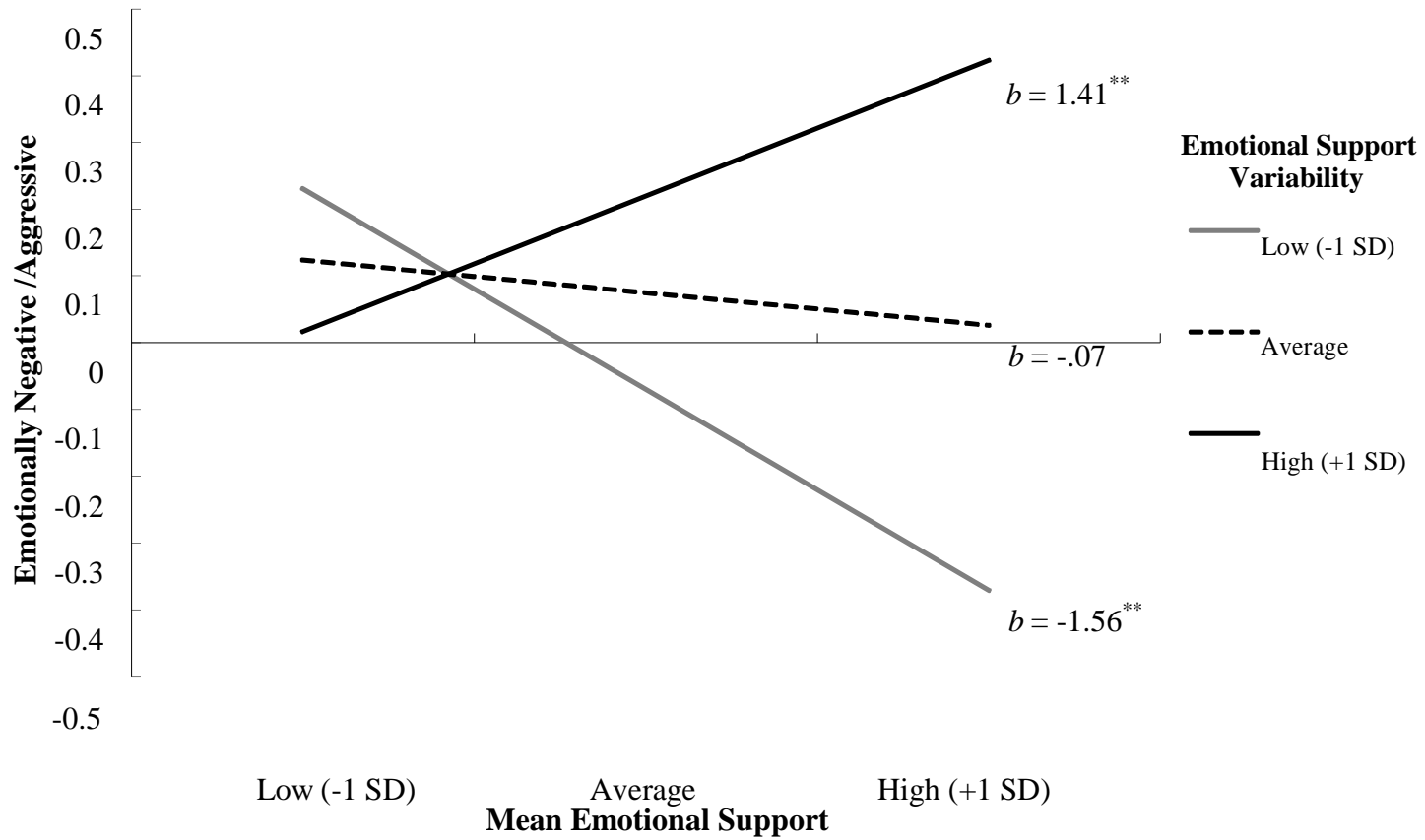


Figure 1. Private center mean emotional support moderated by variability in emotional support predicting children’s emotionally negative/aggressive behavior

## DISCUSSION

The findings of this study are in line with previous research showing that preschoolers' development of social-emotional competence is, in part, dependent on quality interactions with teachers (Mashburn et al., 2007; Mashburn & Pianta, 2006). We had two sets of findings based on the fact that this sample of Head Start and private preschool classrooms, showed different patterns of associations. We found that Head Start teachers tended to be less stressed, more supportive, and more consistent than private center teachers. Additionally, in the Head Start sample, knowing teacher stress, supportiveness, or variability did not help explain any of the observed child behaviors. In regards to private preschool classrooms, there were some additional important findings. First, children in private classrooms with less stressed teachers tended to display more emotion regulation, productive involvement, emotionally positive, and prosocial behaviors than children in private classrooms with more stressed teachers. Second, in private preschool, variability in emotional support predicted children's displays of emotional regulation and productivity. Finally, we found that consistency of emotional support moderated the association between mean levels of emotional support and children's outcomes in private classrooms. The association between teachers' emotional support and children's negative and aggressive behavior was, in part, dependent on the level of variability in emotional support. Children in private classrooms with very supportive teachers showed more negative emotion and aggression if their teacher was inconsistent in providing that support. However, in less emotionally supportive classrooms, consistency was associated with more negative and aggressive behaviors. Together, these findings add to a growing body of evidence that classroom interactions are not necessarily captured best through averaged ratings, but must also include the degree of stability children experience in the classroom.

### Center Type Differences

Head Start centers included in this study were meaningfully different from private centers. Children in Head Start centers experienced, on average, consistently higher levels of emotional support in their interactions with teachers than those in private childcare classrooms. In other words, across Head Start classrooms, students experienced similar levels of average emotional support and variability in emotional support, which may account for the mean differences we found in observed social-emotional behaviors. Head Start teachers reported significantly less stress on average than teachers in private centers, and this difference may be contributing to their ability to provide a consistent, high quality classroom. Some differences between Head Start and private centers were expected based on the work by Sosinsky and colleagues (2007), but not necessarily to the extent evident in these results. Furthermore, the differences between centers are congruent with anecdotal reports from research assistants of Head Start classrooms appearing "more calm" and more "under control" when compared to private centers visited as part of this project.

## Variability Moderated the Association Between Emotional Support and Social Functioning

Children in emotionally supportive classrooms experience positive and responsive interactions with adults, and these types of relationships have been well established as contributors to children's regulation skills, social behavior, and emotional understanding (e.g., Howes, 2000). We sought to add to the literature on both classroom climate and children's social-emotional functioning, and add the construct of variability into the theoretical discussion of what it means to be a high quality teacher. Assessments of quality teaching have mostly been used in ways that emphasize overall classroom experiences without accounting for variability. Interestingly, despite the focus in the field on overall levels of quality in preschool classrooms (Hamre & Pianta, 2007), we found that mean levels of emotional support were not associated with children's observed social-emotional behaviors or with variability in emotional support in the model. By adding variability to our understanding of teacher quality, we were better able to explain the associations between teacher quality and children's social-emotional functioning.

As socializers of children's emotional competence, teachers play a vital role in helping children learn how to accurately predict and respond to others' emotions (Denham, et al., 2012). Children with emotionally variable teachers may feel less confident in social interactions, leading to displays of poorer social competence and a greater number of problem behaviors than peers in classrooms with less variable teachers. Emotionally inconsistent teachers may also make it more difficult for children to learn important social and emotional skills of early childhood. Consequently, children may be unwilling to engage with teachers who are unpredictable in their reactions. For example, if a child has experienced both welcoming and punitive responses when asking a teacher for help, he may be less likely to ask for help in the future.

Our findings add to an emerging body of research on the importance of variability. Curby and colleagues (2013) found that consistency in emotional support was a better predictor of children's social and academic outcomes than mean levels. However, although this work highlights the importance of understanding teacher variability in addition to mean levels of emotional support, the current investigation emphasizes the fact that it is consistency combined with overall levels of emotional support that matter (at least for children in private preschool). Variability affects children's behavior differently depending on the teacher's overall level of emotional support. When combined with the previous work of others (i.e., Curby et al., 2011), these findings necessitate that program directors and researchers reconsider their reliance on solely averaged ratings from classroom observations, and attend instead to the variable ways teachers interact with students.

### Stress & Variability

In the current study, we sought to understand how teacher stress impacts children's observable behavior, possibly by way of the teachers' interactions with students. Substantial research has investigated how teacher stress can impact teacher efficacy and child behavior (Jennings & Greenberg, 2009; Kyriacou, 2001; Marzano et al., 2003). Our results indicated that teachers reporting higher levels of stress were observed to be less supportive overall and less consistent in their supportiveness. This suggests that stressed teachers face their classrooms with depleted

emotional resources, making it more difficult for them to provide consistent, emotionally supportive environments. Stressed teachers may react less predictably to unwanted child behaviors and generally undermine children's social-emotional functioning by making the classroom a less predictable and comfortable place. Additionally, stressed teachers may be less enthusiastic and/or less predictable in their support of positive child behaviors. Collectively, our results lend support to the notion that teacher stress is an important factor influencing the teacher-child relationship and ultimately impacting child outcomes.

## Limitations & Future Directions

Although social interactions have repeatedly been found to be fundamental to children's development, we cannot speak to the causal effects of stress on teacher's variability or of variability on child behavior without an experimental intervention. Intervention research into the impact of variability would be useful in this regard.

We found center type difference in stress, support, and variability, but we do not know the source of these differences. There may be myriad organizational differences, such as levels of teacher education, access to training, and even emotional support provided to the teachers from administrators or peers. Additionally, we know that not all Head Starts are the same, and this sample was limited both in size and geographic representation, so our conclusions may not fully represent the experiences of all students in Head Start. Despite the small sample Head Start, standard estimates, such as  $r$ , and associations between variance components, like ICCs, are standardized and independent of sample size, suggesting that conclusions drawn from the Head Start results are not suffering from Type II error. However, given the small sample, the findings from this study are limited in their generalizability and should still be looked at with caution. Future investigations involving more balanced sample sizes and a more representative selection of centers will be necessary to fully understand center type differences.

Although the majority of results discussed here have applied only to teachers and students in private centers, an alternative view is of the beneficial differences in Head Start classrooms. The significantly higher overall levels of emotional support and its consistency, coupled with lower teacher stress and child negative/aggressive behavior seen in our small Head Start sample should alert administrators and policy-makers to the additional benefits of programmatic differences between Head Start and private care. We hoped that the inclusion of stress in our model would capture some of these programmatic differences. It is clear that additional work will be needed to illuminate fully the processes that impact a teacher's ability to provide high quality, consistent, emotional support to her students. Greater understanding of these processes may be possible through more ethnographic or mixed-methods approaches and should focus on predictors of consistency in Emotional Support.

## CONCLUSION

In sum, the literature suggests that high quality, consistent, and supportive interactions with caregivers have advantageous impacts on child development across social and cognitive domains, and the current study affirms and expands this line of research. The center differences suggest the possibility of underlying programmatic differences between Head Start and private



centers that influence teachers' abilities to provide stable, emotionally supportive classroom environments. In private classrooms, this study adds to calls for the inclusion of both mean and variability measures in discussions of classroom quality. Further, these findings extend research on the impact of variability in the classroom by examining the moderation of emotional support by its variability. Additionally, these findings support exploration of practical ways to strengthen emotional support and its consistency in classrooms where needed.

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