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Temperament and Teacher–Child Conflict in Preschool: The Moderating Roles of Classroom Instructional and Emotional Support

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Abstract

Research Findings: This study is an examination of (a) links between preschool children’s temperament (effortful control, shyness, and anger) and teacher–child conflict and (b) classroom instructional and emotional support as moderators of associations between temperament and teacher–child conflict. Children (N = 104) were enrolled in 23 classrooms in 9 preschools in a Midwestern city. Teachers provided ratings of children’s temperament and parents reported demographic information in the fall of the school year, classrooms were observed in the winter to assess instructional and emotional support, and teachers rated conflict with children in the spring. Multilevel models were estimated, and 3 main findings emerged. First, children’s effortful control was negatively associated with their level of conflict with teachers. Second, children’s effortful control was negatively related to teacher–child conflict in classrooms with low emotional support but unrelated to conflict in classrooms with high emotional support. Third, children’s effortful control was negatively related to conflict in classrooms with high instructional support but unrelated to conflict in classrooms with low instructional support. **Practice or Policy:** Findings highlight the importance of considering the interplay of children’s effortful control and preschool classroom instructional and emotional support in the development of early teacher–child conflict.

Since the 1990s, there has been an accumulation of evidence positioning high-quality teacher–child relationships as beneficial to children’s social and academic outcomes (Davis, 2003; Hamre & Pianta, 2001; Hughes & Kwok, 2007). For example, seminal work from Hamre and Pianta (2001) indicated that teacher–child conflict in kindergarten predicts children’s outcomes as late as eighth grade, and subsequent empirical and theoretical work has pointed to early teacher–child relationships as establishing trajectories for later relationships as well as concurrent and longitudinal academic success in school (e.g., O’Connor, 2010; Rudasill, 2011). Early teacher–child conflict in particular has been shown to have lasting negative associations with children’s behavior, achievement, and social relationships (Hamre & Pianta, 2001; O’Connor, 2010). Given the recognized value of high-quality preschool experiences for establishing positive trajectories for young children’s academic success and the fact that teachers are the conduits through which children receive early intervention and school readiness preparation (Girolametto, Weitzman, & Greenberg, 2003; Rouse, Brooks-Gunn, & McLanahan, 2005), the quality of teacher–child relationships during this period is of paramount importance. Thus, it is

helpful to understand more about the characteristics of children and their environments that are associated with the quality of teacher–child relationships in preschool.

Conflict in the teacher–child relationship seems to be particularly salient for children’s long-term outcomes (e.g., Hamre & Pianta, 2001). Emerging evidence implicates temperamental traits indicative of reactivity (such as shyness and anger) and regulation (such as effortful control; Arbeau, Coplan, & Weeks, 2010; Justice, Cottone, Mashburn, & Rimm-Kaufman, 2008; Rudasill & Rimm-Kaufman, 2009) in the formation of teacher–child conflict. At the same time, findings from research on classroom quality suggest that high-quality classroom interactions can buffer children who are at risk for teacher–child conflict because of temperament or temperament-related behavior problems—that is, difficult temperament (Curby, Rudasill, Edwards, & Perez-Edgar, 2011), behavior problems (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008), or poor attention (Hamre & Pianta, 2005). However, there is little research on how high-quality classroom interactions in preschool may attenuate links between dimensions of temperament and teacher–child conflict. The present study is an examination of preschool classroom quality as a moderator of associations between child temperament and teacher–child conflict. We are particularly interested in teacher perceptions of temperament and teacher–child conflict because teachers are key facilitators of children’s learning and attentive to children’s behavior in the classroom; teacher perceptions of temperament have been more closely linked to children’s school-related outcomes than parent perceptions (Rudasill et al., 2014).

This study uses a goodness-of-fit model (Thomas & Chess, 1977), whereby a child’s temperament is related to his or her outcomes either positively or negatively as a function of the quality of fit between temperament and the child’s environment. For example, a classroom characterized by high levels of emotional support between teachers and children is likely to provide a good fit for children who are low in shyness (bold) or prone to anger because of sensitive responding, awareness of individual needs, and a positive and accepting classroom climate. Likewise, an environment that is instructionally supportive, with the teacher providing opportunities to scaffold learning and encouraging back-and-forth exchanges between teachers and children, is likely to provide a good fit for children with low attention or inhibitory control because of the structure and support for cognitive development. Indeed, there is evidence that children with temperament characteristics that put them at risk for academic or social difficulties are buffered by emotional and instructional support in elementary grades (e.g., Curby et al., 2011; Hamre & Pianta, 2005; Rudasill, Gallagher, & White, 2010). The extent to which this is the case for mitigating teacher–child conflict has been less studied, yet it is an important line of inquiry given the body of evidence showing teacher–child conflict as a predictor of concurrent and future academic and social difficulties (Davis, 2003; Hamre & Pianta, 2001).

Temperament and Teacher–Child Conflict

Temperament is defined as an individual’s response to environmental stimuli in terms of emotion, action, and attention; it is biologically based yet shaped by environment and development (Kagan & Fox, 2006; Rothbart, 2011; Thomas & Chess, 1977). Broadly speaking, temperament is conceptualized as comprising inherent differences in reactivity and the ability to regulate (Rothbart & Bates, 2006). Temperamentally based regulation, also called *effortful control* (Rothbart & Bates, 2006), is typically conceptualized in temperament research as including inhibitory control and attentional focusing and is demonstrated via a child’s ability to inhibit inappropriate responses, enact appropriate ones, and attend to classroom activities (Rothbart & Bates, 2006). These skills are clearly linked to children’s success in the classroom environment (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Reactivity is demonstrated by a child’s intensity and duration of response to stimuli in the environment and includes traits such as withdrawal (shyness, fear) and excitement (approach, activity, and anger) responses (Rothbart & Bates, 2006).

Temperament traits indicative of regulation (i.e., effortful control) and reactivity (i.e., anger, shyness) have been linked to academic and social outcomes for children in preschool and elementary grades (McClowry, Snow, Tamis-LeMonda, & Rodriguez, 2010; Pekrun, Elliott, & Maier, 2009; Rudasill & Rimm-Kaufman, 2009; Valiente, Lemery-Chalfant, & Swanson, 2009) and are particularly salient to the development of children's relationships with teachers because these temperament dimensions either facilitate or hinder successful interactions with others. Higher levels of regulation allow a child to manage behavior and emotions so that they match the contextual expectations, and lower levels of reactivity yield milder responses to events, situations, or people (Valiente, Swanson, & Lemery-Chalfant, 2012). Together, then, higher regulation and lower reactivity promote behaviors that elicit positive interactions, whereas lower regulation and higher reactivity promote behaviors that elicit more negative responses or avoidance (Rothbart & Jones, 1998). It should be noted that in the case of shyness, higher reactivity results in a greater withdrawal response or avoidance, whereas a low level of shyness (i.e., being bold) is the absence of withdrawal or avoidance; in this way, less shy children's behavior may be similar to that of their less regulated peers.

Both regulatory and reactive dimensions of temperament have been linked to conflict in the teacher–child relationship. Specifically, effortful control (the combination of attentional focusing and inhibitory control) has been negatively related to teacher–child conflict in early elementary grades (Liew, Chen, & Hughes, 2010; Rudasill, 2011; Silva et al., 2011; Valiente et al., 2012). Findings from several studies of children in preschool and elementary grades converge on shyness as a reactive dimension that is predictive of teacher–child relationship quality, with less shy (bold) children likely to be perceived as having higher levels of conflict with teachers than their shy peers (Justice et al., 2008; Rudasill, 2011; Zhang, Wang, & Chen, 2010). Similarly, there is some evidence that children higher in anger have more conflict in relationships with preschool teachers (Justice et al., 2008), although this association has been investigated less than the association between shyness and teacher–child relationship quality. Thus, in the present study, we examine key markers of temperamental regulation (i.e., effortful control) and reactivity (i.e., shyness, anger) that have been previously linked to teacher–child conflict in preschool or early elementary school and determine the extent to which their associations with teacher–child conflict are ameliorated by classroom instructional and emotional support.

Instructional and Emotional Support and Teacher–Child Conflict

Instructional support is characterized by scaffolding, questioning, and feedback exchanges between teachers and children. A classroom with high instructional support has rich and detailed interactions between children and teachers that are linked to and extend academic content. As expected, there is evidence that instructional support promotes children's academic performance (Perry, Donohue, & Weinstein, 2007; Pianta, La Paro, Payne, Cox, & Bradley, 2002) and can buffer elementary school-age children against low achievement if they are at risk because of low socioeconomic status or poor attention (Hamre & Pianta, 2005). Mashburn and colleagues (2008) examined data from two national samples of public prekindergarten (pre-K) programs (representing 80% of children in the United States in public pre-K). They found that measures of instructional support predicted children's academic and language skills in pre-K, whereas two other commonly used measures of pre-K classroom quality (National Institute for Early Education Research standards and the Early Childhood Environment Rating Scale) were poor predictors of children's academic and language skills.

An emotionally supportive classroom is characterized by high levels of teacher sensitivity and regard for children's perspectives and a positive climate with low levels of negativity between teachers and children (Pianta, La Paro, & Hamre, 2008). Markers of an emotionally supportive classroom are teacher behaviors indicating that he or she is in tune with children's needs and responsive to their cues, developmentally appropriate opportunities for children to make decisions and show leadership, and a warm and accepting classroom environment. The level of emotional support in the classroom,

particularly during early childhood, is quickly becoming recognized as a mechanism for fostering not just social but also academic success in elementary grades. Indeed, children who feel safe with and valued by the teacher are likely to be mentally ready to handle academic information, whereas children who are worried or feel uneasy in the classroom may be preoccupied and unable to take in new information. Instructional and emotional support may be key moderators between children's risk and their academic and social success. Hamre and Pianta (2005) captured this clearly with evidence that children with multiple risk indicators fared as well as their low-risk peers when they were in instructionally and emotionally supportive classrooms in first grade. Similar findings have been reported in other studies with children in first-grade (Curby, Rudasill, Edwards, & Perez-Edgar, 2011; Merritt, Wanless, Rimm-Kaufman, Cameron, & Peugh, 2012) and third-grade (Rudasill et al., 2010) classrooms.

There have been only a few investigations of the moderating effects of classroom instructional and emotional support on teacher-child conflict, and they have involved elementary children rather than preschool children, who are the focus of the current study. For example, using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development, Hamre and Pianta (2005) examined first-grade classroom quality (observed instructional and emotional support) as a moderator of associations between children's functional and demographic risk and teacher-child conflict. They found that children with multiple indicators of functional risk (e.g., low attention, high externalizing behavior) had more conflict with first-grade teachers when they were in classrooms with low emotional support than in classrooms with moderate or high emotional support.

Results from a study of kindergarten children in Belgium showed that classroom emotional support buffered associations between children's internalizing or externalizing behavior and high levels of teacher-child conflict (Buyse et al., 2008). That is, although children with problematic behaviors had been expected to develop more conflictual relationships with their teachers, their relationships were actually more similar to those of their peers when they were in classrooms with high levels of emotional support. However, emotional support in the Buyse et al. (2008) study was based on teacher report rather than observations of classrooms.

Collectively, evidence from studies with elementary school-age students suggests that there may be a link between instructional and emotional support in the classroom and teacher-child conflict but also that classroom instructional and emotional support may be protective for children whose temperament or behavior places them at risk for forming conflictual relationships with teachers. It is important to examine this link during the preschool epoch when children are gearing up for the transition to formal schooling and experiencing dramatic growth in regulatory skills (Posner & Rothbart, 2007). Enrichment experiences in preschool have been linked to cognitive gains into early adulthood, suggesting that on a neurological level, the preschool period represents a critical period in the development of brain structure (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Fox, Levitt, & Nelson, 2010). In addition, early relationships with teachers are the foundation on which interventions and first impressions of school environments are built (Rouse et al., 2005). Thus, in this study we examine observed instructional and emotional support in the preschool classroom as moderators between children's temperament and teacher-child conflict.

The Present Study

The purpose of this study is to extend emerging evidence linking child temperament to teacher-child conflict and examine the role of preschool classroom context (i.e., instructional and emotional support) in mitigating these associations. Specifically, classroom instructional and emotional support were examined as moderators of the associations between children's temperament (effortful control, shyness, and anger) and teacher-child conflict in preschool. We expect that teachers' ratings of children's temperament will be associated with their assessments of teacher-child conflict, such that low effortful control, low shyness, and high anger will be associated with more teacher-child conflict. In terms of our moderators, we expect higher instructional and emotional support to ameliorate risk of high conflict for children who have low effortful control, low shyness, and high anger.

Method

Participants

Participants were 104 children (56 female) in 23 classrooms (22 female teachers) across nine child care programs (eight private, one public) in a city in the Midwestern United States. The number of student participants per classroom varied, but no classroom had more than six participants. Given the need to balance available resources with the goal of maximizing the number of teachers and classrooms in the study, in classes in which more than six children received parental consent to participate, six children were randomly selected for inclusion. An average of 4.5 children in each classroom ($SD = 1.6$) participated in the study.

Child participants were typically developing, with a mean age of 50 months (range = 32–63 months, $SD = 6.22$) at the beginning of the study. Parents identified the majority of the children in the sample as White non-Latino (82%, $n = 85$), followed by multiracial (10%, $n = 10$), Latino (4%, $n = 4$), Asian (3%, $n = 3$) and Black/African American non-Latino (1%, $n = 1$). English was a first language for 92% of the children, 5% were dual language speakers at home, and 3% spoke a language other than English at home. All children spoke English in their preschool classrooms. Annual family income was reported using a scale from 1 = <\$5,000 to 11 = >\$95,000 ($M = 8$, \$65,000–75,000). See Table 1 for sample demographics and Table 2 for Pearson correlation coefficients between the variables.

Table 1. Descriptive Statistics.

Variable	M	SD	n	%
STRS conflict	23.60	8.90		
Age (months)	50.06	6.68		
Family income	8.22	3.32		
CBQ effortful control	0.00	0.38		
CBQ shyness	3.59	1.23		
CBQ anger	4.76	0.88		
CLASS emotional support	5.65	0.922		
CLASS instructional support	3.07	1.12		
Child gender—female			55	53%
Child gender—male			48	47%

Mean estimates were obtained in Mplus using full information maximum likelihood estimation. CBQ effortful control is a factor score combination of the CBQ Attention Focusing and Inhibitory Control subscales. STRS = Student-Teacher Relationship Scale; CBQ = Children's Behavior Questionnaire; CLASS = Classroom Assessment Scoring System-Pre-K.

Table 2. Correlations between study variables.

Variable	1	2	3	4	5	6	7	8	9
1. STRS conflict	—								
2. Age (months)	-.33	—							
3. Gender (0 = female, 1 = male)	.12	-.05	—						
4. Family income	-.00	-.01	.04	—					
5. CBQ shyness	-.21	.08	-.18	.16	—				
6. CBQ anger	.03	-.05	.15	-.10	.23	—			
7. CBQ effortful control	-.22	.23	-.33	.25	.07	-.19	—		
8. CLASS emotional support	.24	-.31	-.14	.21	.07	-.07	-.01	—	
9. CLASS instructional support	.15	.01	.03	.27	.16	-.01	.06	.31	—

Correlations greater than .25 are in bold. CBQ effortful control is a factor score combination of the CBQ Attention Focusing and Inhibitory Control subscales. STRS = Student-Teacher Relationship Scale; CBQ = Children's Behavior Questionnaire; CLASS = Classroom Assessment Scoring System-Pre-K.

Measures

Demographics

Demographic information was obtained using a parent questionnaire in which parents provided information regarding their age, education level, occupation, family income, marital status, race/ethnicity, and first language and their children's birthdate, race/ethnicity, first language, and gender.

Classroom Emotional and Instructional Support

The Classroom Assessment Scoring System–Pre-K (CLASS Pre-K; Pianta et al., 2008) was used to measure the quality of teacher–child interactions in preschool classrooms. The CLASS Pre-K is an observational tool for assessing classroom quality across three domains: Emotional Support, Instructional Support, and Classroom Organization. Although the complete CLASS assessment was used, in this study we focused on the Emotional and Instructional Support domains because there is more evidence for moderating effects in the literature for those domains (e.g., Curby et al., 2011; Dominguez, Vitiello, Fuccillo, Greenfield, & Bulotsky-Shearer, 2011; Hamre & Pianta, 2005; Mashburn et al., 2008). The Emotional Support domain is composed of four dimensions: positive climate (displays of positive emotion and warmth), negative climate (displays of anger and negativity), teacher sensitivity (teacher engages in responsive and sensitive interactions), and regard for student perspectives (many opportunities for student contributions, teacher displays flexibility). The Instructional Support domain has three dimensions: concept development (many opportunities for student analysis, reasoning, and creativity), quality of feedback (teacher uses scaffolding and provides opportunities for critical thinking), and language development (there are frequent classroom conversations and open-ended questions). Researchers who were CLASS certified observed each classroom for two cycles (20min of observation followed by 10min of coding) during morning instructional time and scored each dimension using a 7-point Likert scale. Scores of 1–2 indicate low quality, 3–5 indicate moderate quality, and 6–7 indicate high quality. Interrater reliability was established to within 1 point for an average of 90% of the CLASS dimensions for 10% of observations. In studies of preschool classrooms using the CLASS, emotional support tends to be at the high end of the moderate range of scores (between 5 and 6), whereas instructional support tends to range from 2 to 3 (e.g., Maier, Vitiello, & Greenfield, 2012; Mashburn et al., 2008).

Teacher–Child Conflict

The Student–Teacher Relationship Scale (STRS; Pianta, 2001) was used to measure the teachers' perceptions of their relationships with their students. The STRS is a 28-item teacher-report questionnaire that asks teachers to rate their relationships with students on a 1–5 scale where 1 = *definitely does not apply* and 5 = *definitely does apply*. The STRS contains three subscales: Conflict, Closeness, and Dependency. For the current study we used only the Conflict subscale (12 items). An example item for this scale is "This child and I always seem to be struggling with each other." Subscale internal consistency within this sample of children was high ($\alpha = .87$).

Child Temperament

Teachers rated children's temperament on seven subscales (Activity, Anger, Approach, Attentional Focusing, Fear, Inhibitory Control, Shyness) of the Children's Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fischer, 2001), resulting in a measure with 91 items (13 items per subscale). Teachers rated children's behavior using a 7-point scale ranging from 1 (*extremely untrue of your child*) to 7 (*extremely true of your child*). We included reactive and regulatory temperament dimensions that have been connected to teacher–child relationship conflict in the literature: shyness ("Is sometimes shy even around people s/he has known a long time," $\alpha = .94$, 13 items); anger ("Has temper tantrums when s/he doesn't get what s/he wants," $\alpha = .93$, 13 items); and effortful control, a composite factor score¹ made

1. Using Mplus Version 7.0 (L. K. Muthén & Muthén, 1998–2012) with maximum a posteriori scoring to generate factor scores (B. Muthén, 2008).

up of inhibitory control ("Is usually able to resist temptation when told s/he is not supposed to do something," $\alpha = .89$, 13 items) and attentional focusing ("When picking up toys or other jobs, usually keeps at the task until it's done," $\alpha = .81$, nine items). Inhibitory control and attentional focusing were highly correlated (.72) and have been combined to form an effortful control variable in previous studies (Olson, Sameroff, Kerr, Lopez, & Wellman, 2005; Rudasill & Rimm-Kaufman, 2009; Schmitt, Pentimonti, & Justice, 2012). The composite factor score for effortful control was used in all subsequent analyses (composite reliability $\omega = 0.52$; Geldhof, Preacher, & Zyphur, 2014).

Procedure

In the fall of the school year (October and November), parents completed the demographic questionnaire and teachers completed the Children's Behavior Questionnaire (Rothbart et al., 2001) for each study child in his or her classroom. Classroom quality was assessed using the CLASS Pre-K (Pianta et al., 2008) in early spring (February-March). Teachers completed the STRS (Pianta, 2001) in late spring (April-May).

Data Analysis

Models were estimated in Mplus 7.1 using the TYPE = TWOLEVEL analysis function and full information maximum likelihood estimation. Children (Level 1) in the sample were nested within classrooms (Level 2) and child care programs (Level 3). We initially included program in the model as a random effect but removed it because there was essentially no variation at the program level. Our final hierarchical linear model included two levels, in which children (Level 1) were nested within classrooms (Level 2). Children's effortful control, shyness, and anger were included as predictors and classroom emotional support and classroom instructional support as moderators. The general statistical model is expressed as follows:

$$y_{ij} = \beta_0 + \sum_j \beta_j X_{ij} + \sum_m \beta_m X_{jm} + \sum_n \beta_n X_{in} + \sum_{jm} \beta_{jm} X_{ij} X_{jm} + e_{2i} \quad (1)$$

where y_{ij} is the conflict score for the i th child in the j th classroom, β_0 is the intercept, β_j is the linear slope for the j th temperament variable (j = effortful control, shyness, and anger), X_{jm} is the m th CLASS domain variable for the j th classroom, β_m is the linear slope for the m th CLASS domain variable (m = classroom emotional support and classroom instructional support), X_{ij} is the j th child temperament variable for the i th child, β_n is the covariate effect for the n th child or family demographic variable (age), X_{in} is the n th demographic variable for the i th child, and e_{ij} is the residual.

The interactions between classroom emotional support, classroom instructional support, and children's temperament (effortful control, shyness, and anger) were examined using a top-down approach (Raudenbush & Bryk, 2002), in which we started with the most complex full model (all interactions) and removed higher order interactions until we reached nonsignificance ($p > .05$) of the higher order effects. Given the small sample size, nonsignificant temperament and control variables were also removed. The final model was the end result of this model-building process. Missing data were present for our remaining control variable (age), so we made this variable part of the model by specifying its variance parameter in Mplus (L. K. Muthén & Muthén, 1998-2012). The other variables included in the final model (i.e., effortful control and two CLASS variables) did not have missing data. By using a latent variable factor score to create the composite variable, the estimation procedure in Mplus estimated a value for each set of scores regardless of missing values. One student was omitted because of missing classroom identification information, resulting in a final model sample size of 103.

Results

Bivariate correlations between all variables revealed a few moderate relationships. Conflict and classroom emotional support were negatively related to child age ($-.33$ and $-.31$, respectively), being female was associated with higher effortful control ($-.33$), being from a higher income family was associated with higher effortful control ($.25$), and classroom emotional support and instructional support were positively related ($.31$; see Table 2).

One focus of our analyses was the moderating effect of Level 2 classroom context variables on the relationship between Level 1 teacher–child conflict and children’s temperament, so we chose to group mean center our Level 1 temperament variables and grand mean center the age covariate and Level 2 variables (see Enders & Tofighi, 2007). Based on this centering method, temperament parameters are interpreted as the level change in a parameter for a child relative to other individuals within his or her classroom. This centering method allowed us to directly test the moderating effect of Level 2 classroom predictors on the relationship between the child-level variables and outcome variable, removing any Level 2 influence from the child-level variables. Data management procedures for creating the group- and grand-mean-centered variables were conducted in SAS prior to analysis in Mplus. The empty null model with no predictors or control variables revealed that 40% of the variance in teacher–child conflict occurred between classrooms (intraclass correlation = $.40$).

A significant higher order interaction was found between effortful control and classroom emotional support ($b = 7.85$, $SE_b = 2.40$, $p < .01$). A simple effects analysis was conducted by using the MODEL CONSTRAINT option in Mplus. This option allowed us to simultaneously estimate and test the slope for effortful control at different values of our moderator, emotional support. For the current simple slopes test, high and low values correspond to 1 SD above and below the mean. Simple effects of effortful control on conflict were $b = -13.56$, $p < .01$, and $b = 2.14$, $p > .05$, at low and high values of emotional support, respectively. As shown in Figure 1, when we held all other variables constant, children in classrooms with below-average emotional support were predicted to score lower on conflict as their observed effortful control increased. Pseudo- R^2 , used as a measure of effect size for the within (Level 1) and between (Level 2) portions of the model (Singer & Willett, 2003), indicated that

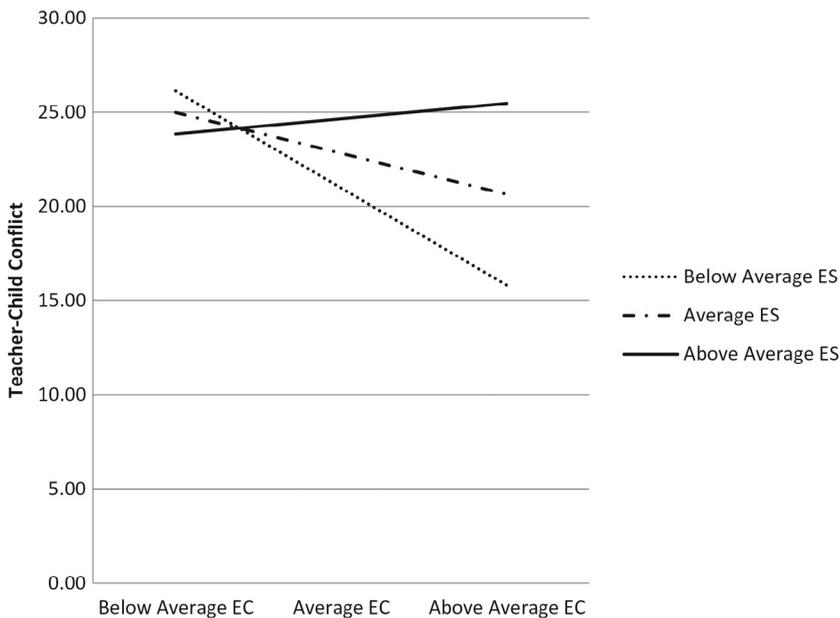


Figure 1. Predicted values for teacher–child conflict scores based on effortful control (EC) and classroom emotional support (ES), holding all other variables constant. Students are defined as high or low based on 1 SD above or below the mean. Simple effects of EC on conflict were $b = -13.56$, $p < .01$, and $b = 2.14$, $p > .05$, at low and high values of ES, respectively.

15% of the within-group variation in teacher-child conflict was accounted for by the interaction between effortful control and classroom emotional support. Essentially, there was no reduction in the percentage of between-group variation in teacher-child conflict with the inclusion of the interaction, potentially indicating that there was more variability within classrooms on this variable as opposed to between classrooms (see Table 3).

Finally, there was a significant higher order interaction between effortful control and classroom instructional support ($b = -4.80, SE_b = 1.82, p < .05$). When instructional support was recentered, the simple effect of effortful control on conflict was $b = -0.90, p > .05$, and $b = -10.51, p < .01$, at low and high values of emotional support, respectively. Figure 2 demonstrates that when we held all other

Table 3. HLM Regression Coefficients: STRS Conflict.

Parameter	Unstandardized Coefficients		
	Estimate	SE	<i>p</i>
Fixed effects			
Intercept	22.72	1.41	<.01
Age	-0.38	0.16	.02
CBQ effortful control	-5.71	2.05	<.01
CLASS emotional support	1.84	1.67	.27
CLASS instructional support	0.91	1.20	.45
CBQ Effortful Control × CLASS Emotional Support	7.85	2.40	<.01
CBQ Effortful Control × CLASS Instructional Support	-4.80	1.82	<.01
Random effects			
Classroom	23.37	10.93	.03
Residual	35.56	6.43	<.01

$\chi^2(4) = 3.82, p = .43$, root mean square error of approximation = 0.00, comparative fit index = 1.00. Only significant higher order parameters were retained for the final model. CBQ effortful control is a factor score combination of the CBQ Attention Focusing and Inhibitory Control subscales. HLM = hierarchical linear model; STRS = Student Teacher Relationship Scale; CBQ = Children’s Behavior Questionnaire; CLASS = Classroom Assessment Scoring System–Pre-K.

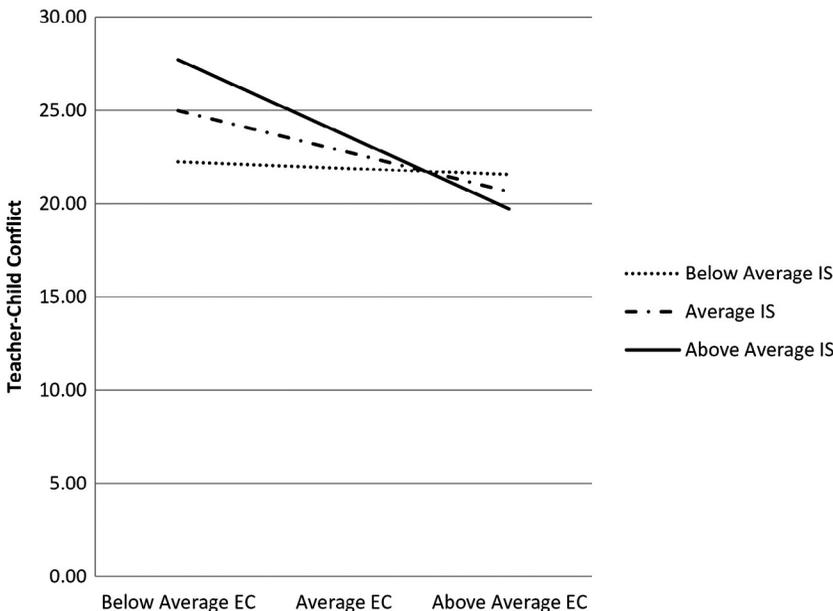


Figure 2. Predicted values for teacher-child conflict scores based on effortful control (EC) and classroom instructional support (IS), holding all other variables constant. Students are defined as high or low based on 1 SD above or below the mean. Simple effects of EC on conflict were $b = -0.90, p > .05$, and $b = -10.51, p < .01$, at low and high values of IS, respectively.

variables constant, children in classrooms with above-average instructional support were predicted to score lower in conflict as effortful control increased. Pseudo- R^2 indicated that 11% of the within-group variation in teacher-child conflict was accounted for by the interaction between effortful control and classroom instructional support. There was no reduction in the percentage of between-group variation in teacher-child conflict with the inclusion of the interaction (see Table 3).

Discussion

In the present study, we examined child temperament dimensions (effortful control, shyness, and anger) as predictors of teacher-child conflict in preschool and explored the moderating roles of preschool classroom instructional and emotional support on these associations. Three main findings emerged. First, children's effortful control was a negative predictor of teacher-child conflict. Second, children's effortful control was negatively related to teacher-child conflict in classrooms with low emotional support but unrelated to conflict in classrooms with high emotional support. Third, children's effortful control was negatively related to conflict in classrooms with high instructional support but unrelated to conflict in classrooms with low instructional support. Each of these findings is discussed here.

Temperament and Teacher-Child Conflict

In our model, we found main effects for effortful control and child age. As expected, children's effortful control was negatively associated with teacher-child conflict. This is consistent with previous research conducted with children in elementary grades (e.g., Rudasill & Rimm-Kaufman, 2009), suggesting that children who are able to regulate their behavior have an early advantage in terms of teacher-child relationship formation. The negative association between child age and teacher-child conflict was somewhat unexpected; in a study of 840 children ranging from 3 to 7 years old, Saft and Pianta (2001) found that teachers perceived higher levels of conflict with older children. However, other studies have shown that as children age, conflict with teachers is likely to decrease. For example, Stuhlman and Pianta (2004) found that children had lower conflict with teachers in preschool than they did in kindergarten and first grade. Although it is possible that the results presented here regarding age reflect differences in preschool settings, this is unlikely because all participating preschools had classrooms serving children from 3 to 5, the range of ages of children in the current study.

In our bivariate correlations, children's shyness and anger were unrelated to teacher-child conflict. Previous studies (Justice et al., 2008; Rudasill, Rimm-Kaufman, Justice, & Pence, 2006) with preschool samples have shown negative associations between shyness and conflict and positive associations between anger and conflict. In addition, we did not find a significant correlation between child gender and conflict despite consistent findings in the literature that boys are more likely to have conflict with teachers than girls (e.g., Ewing & Taylor, 2010; Hamre & Pianta, 2001). It is likely that because of our relatively small sample size, we were unable to detect these smaller effects and only the most prominent effects were detectable. It is also quite possible that children's effortful control was suppressing the effects of their shyness or anger in their interactions with teachers. Although these children were quite young and situated in a period of rapid regulatory growth, the influence of children's regulatory skills on their outcomes is significant (e.g., Masten, 2014; Moffitt, Poulton, & Caspi, 2013; O'Connor, Cappella, McCormick, & McClowry, 2014).

Emotional Support × Effortful Control

The association between children's effortful control and teacher-child conflict varied with the level of observed emotional support in the preschool classroom. In classrooms with high emotional support, teacher-child conflict was unrelated to children's effortful control. This is congruent with work suggesting that more emotional support is protective and evens the playing field for children who are at risk socially or academically (e.g., Hamre & Pianta, 2001). However, we also found that in classrooms

with high emotional support, teachers rated all children as high in conflict. In classrooms with low emotional support, children's effortful control was negatively related to conflict; that is, in less emotionally supportive classrooms, children with higher effortful control had lower levels of teacher–child conflict. Indeed, children in classrooms with low emotional support who had high effortful control had much lower levels of conflict with teachers than children in more emotionally supportive classrooms or with less effortful control (see Figure 1).

Although we did not expect low emotional support to foster low teacher–child conflict for children with high effortful control (whereas children with high effortful control in classrooms with high emotional support had high teacher–child conflict), these findings are consonant with those from a study of Head Start children by Vitiello et al. (2012). They found that more regulated children (termed *resilient*) showed greater improvement across the school year on measures of language and literacy when they were in classrooms with lower (vs. higher) instructional support. Although the results from the current study reflect emotional support, not instructional support, the explanation provided by Vitiello et al. could be applied to our results. That is, children with high effortful control may find teachers' sensitive and responsive behaviors to be distracting, which thus results in more conflict with teachers. Similarly, teachers in classrooms that are high in emotional support are applying consistent and concerted efforts to engage positively with students and stay attuned to their needs; thus, such teachers are also likely to be aware when students are having a bad day and feel the effects of a child's negative mood. It is also possible that classrooms with high emotional support were simultaneously lower in instructional support, which could be frustrating for children with a greater ability to regulate attention and behavior. However, the correlation between instructional support and emotional support in the current study was small ($r = .31, p < .05$), rendering that explanation less plausible.

Another explanation for these findings is that classrooms with similar scores for emotional support may have varied in consistency in emotional support across the day; Brock and Curby (2014) found that consistency in emotional support in pre-K classrooms above and beyond the average level of emotional support predicted teacher–child conflict in pre-K. That is, less consistency in emotional support across the day was associated with more teacher–child conflict. In Brock and Curby's study, emotional support and emotional support consistency across the day were significantly negatively correlated ($r = -.59$), suggesting that classrooms with higher average emotional support are also more likely to be less consistent in emotional support than classrooms with lower average emotional support. It could be that children who are higher in effortful control are more attuned to classroom processes and thus more frustrated when there is variability in emotional support; from that perspective, it is logical that children with higher effortful control would have more conflict with teachers when there is high emotional support and less conflict when emotional support is low. Although these results are intriguing, further research is needed.

Instructional Support × Effortful Control

In classrooms with low instructional support, children's effortful control was unrelated to their conflict with teachers. However, in classrooms with high instructional support, children with low effortful control had more conflict than children with high effortful control (see Figure 2). This finding may be understood in the context of instructional support scores across classrooms in this study in reference to low, mid-range, and high levels of instructional support identified by the developers of CLASS (Pianta et al., 2008). Average instructional support in this sample was 3.07, which is a low score in the mid-range according to the CLASS manual (mid-range is from 3 to 5; Pianta et al., 2008). Classrooms in this sample with below-average instructional support (1.95) were in the low range according to the CLASS manual (low range is a score below 3), and classrooms with above-average instructional support (4.19) were solidly in the mid-range according to the CLASS manual. Thus, there was a significant contrast in the level of instructional quality experienced by children in classrooms with below- versus above-average instructional support. According to the CLASS manual (Pianta et al., 2008), classrooms with mid-range levels of instructional support (above average in the current

study) are characterized by “opportunities for analysis and reasoning ... interspersed with more rote types of learning” (p. 65), and “The teacher sometimes uses students’ incorrect or nonresponses as an opportunity to scaffold learning by providing hints or assistance” (p. 71). In contrast, low levels of instructional support are characterized by “the preponderance of teaching ... focused only on getting students to remember and repeat facts and practice basic skills” (p. 63), and “The teacher ... tends to move quickly during lessons and fails to use hints or assistance when students do not understand something or give an incorrect answer” (p. 70). These examples illustrate the increased cognitive demand on children in classrooms where teachers score higher on instructional support.

In more instructionally supportive classrooms, children are encouraged to connect information in meaningful ways, understand their thinking processes, and use increasingly complex language (Pianta et al., 2008). It is possible that teachers who are observed to be engaging children in higher levels of cognitive interactions also perceive more conflict with children who are frustrated with or overwhelmed by this level of cognitive demand. Indeed, these findings are consistent with those from a study of associations between children’s characteristics, classroom quality, and approaches to learning in Head Start programs (Dominguez et al., 2011). Dominguez et al. (2011) found that in classrooms with high instructional support, higher risk children (characterized by having more difficulties interacting with teachers) had lower approaches to learning, whereas in classrooms with low instructional support, there was no association between children’s risk and approaches to learning. Dominguez et al. postulated that children with difficulties interacting successfully with teachers may need additional supports, such as interventions to address behavioral problems, before being able to benefit from cognitively stimulating instruction. This conclusion also fits our findings; that is, higher instructional support may result in increased teacher–child conflict when students have characteristics that place them at increased risk for academic difficulties. Thus, it may be that children who are low in effortful control first need support gaining regulation skills before they are able to engage productively and positively with teachers and, ultimately, benefit fully from high-quality instruction.

Limitations and Future Research

This study has several limitations that should be noted. First, although observations of classroom emotional and instructional support strengthen this study, the CLASS provides a global measure of classroom quality rather than a measure of how individual children engage with teachers, peers, and activities. With the development of the Individualized Classroom Assessment Scoring System (Boonen, Downer, & Vitiello, 2012), observers are able to examine the classroom involvement and behaviors of individual children. Such observations would allow for relations between temperament and child behaviors in the classroom to be assessed as contributors to teacher–child conflict. Considering the reciprocal relations between the behaviors of individual children and their teachers is important for a more complete understanding of factors in the classroom environment that may influence associations between temperament and teacher–child conflict. Second, teachers rated children’s temperament and the level of conflict in relationships with children; even though classroom quality was measured via observations by researchers, the shared method variance between temperament and teacher–child conflict may have accounted for some of the magnitude of the associations that emerged here. Third, given that teachers were primary reporters and that observations of classrooms included teacher behavior, more demographic information on teachers (years of experience teaching preschool, degrees, specialized training or certificates, age, race/ethnicity) would be helpful for generalizing results to groups of teachers. Fourth, 15% of children did not have scores for teacher–child conflict; although we carefully examined scores on predictor variables for those missing teacher–child relationship scores and those who were not missing those scores, it is possible that there was a systematic difference between groups that we could not detect or account for in analyses. Fifth, we were unable to examine consistency in instructional and emotional support across the school day or year; an extension of this study should include multiple observations of classroom processes to enable the consistency of teachers’ classroom processes to be studied. Finally, this study included a relatively

small sample that was somewhat homogenous in terms of race/ethnicity. Future studies should extend this work to include larger, more heterogeneous samples for increased generalizability. In addition, future work with larger samples may reveal Temperament \times Classroom Quality effects on teacher–child conflict that did not emerge here.

Implications for Practice

Findings from this study and others (Curby et al., 2011; Justice et al., 2008; Rudasill & Rimm-Kaufman, 2009; Rudasill et al., 2006) highlight the importance of considering the role of children's temperament in the development of their relationships with teachers in early childhood. Teacher training and professional development programs could be strengthened by emphasizing individual differences in temperament and the ways in which these differences influence children's adjustment to the social (and academic) demands of the classroom (Keogh, 2003). Indeed, a temperament-based teacher and classroom program (INSIGHTS into Children's Temperament) has shown significant promise for positively affecting young children's academic and social skills (McClowry et al., 2013), particularly for children who are shy or more prone to negative emotions, such as anger (McCormick, O'Connor, Cappella, & McClowry, 2014; O'Connor et al., 2014). The mechanism by which this occurs is through improvements in children's regulation skills; thus, teacher understanding of temperament and application of classroom management that is tailored to individual differences in temperament foster children's abilities to stop and think before acting. This in turn promotes better academic and behavioral outcomes (O'Connor et al., 2014).

This study's results also point to the potential contributions of classroom processes to children's relationships with teachers. Although teachers' high-quality practices are valuable to children's success (e.g., Pianta et al., 2008), it also appears that the extent to which such processes promote positive relationships between teachers and children varies as a function of children's temperament characteristics. That is, a one-size-fits-all approach may not maximize outcomes for children. As teachers are trained on best practices, it is important to provide ample support through coaching and professional development communities. An example of ongoing support for teachers is MyTeaching-Partner (<http://curry.virginia.edu/research/centers/castl/mtp>), a Web-based coaching program personally tailored to teachers' individual experiences, situations, and needs that provides targeted feedback, reinforcement, and frequent interactions with a consultant. These types of programs provide teachers with resources to tailor their classrooms to meet the needs of individual students and optimize student outcomes.

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